



P-DUKE POWER

MAF150 Series

2 X 4 Inch AC-DC POWER SUPPLIES
Up to 150 Watts

5
YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT



Medical



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



PV



Railway

c **UL** US

CB

CE

FC



2
X
MOPP

4000
VAC
Reinforced
Insulation

ADJ.
Output
Voltage

Internal
EN55032
Class **B**
Filter

LOW
Leakage
Current

LOW
Standby
Power

Protection
Class I
Class II

Operating
Altitude
5000
meter

OCP

OVP

SCP

PART NUMBER STRUCTURE

M	A	F	150	U	S	12	B	-		
Application	Package Code	Dimension Code	Output Power (W)	Input Voltage (VAC)	Output Quantity	Output Voltage (VDC)	Protection Type		Option	
Medical Application	A:Open type U:U chassis type E:Enclosed type D:Din rail type			U: Universal 85 ~ 264VAC	S:Single	12:12V 15:15V 18:18V 24:24V 28:28V 36:36V 48:48V	B:CLASS II Blank:CLASS I		First Code Blank:JST M:Molex T:Terminal block Second Code F:External FAN (for MEF/ MDF)	

TECHNICAL SPECIFICATION All specifications are typical at 230VAC input, full load and 25°C unless otherwise noted

Model Number	Input Range VAC	Output Voltage VDC	Output Current		Efficiency %
			Natural convection A	Forced air cooling With 10CFM / Option with Fan A	
MAF150US12B	85 ~ 264	12	8.34	12.5	91
MUF150US12B			8.34		
MEF150US12B			10.84		
MDF150US12B			10.84		
MAF150US15B	85 ~ 264	15	7.34	10	92
MUF150US15B			7.34		
MEF150US15B			9		
MDF150US15B			9		
MAF150US18B	85 ~ 264	18	6.12	8.34	92
MUF150US18B			6.12		
MEF150US18B			7.5		
MDF150US18B			7.5		
MAF150US24B	85 ~ 264	24	4.59	6.25	92
MUF150US24B			4.59		
MEF150US24B			5.63		
MDF150US24B			5.63		
MAF150US28B	85 ~ 264	28	3.93	5.36	92
MUF150US28B			3.93		
MEF150US28B			4.83		
MDF150US28B			4.83		
MAF150US36B	85 ~ 264	36	3.06	4.17	92
MUF150US36B			3.06		
MEF150US36B			3.75		
MDF150US36B			3.75		
MAF150US48B	85 ~ 264	48	2.09	3.13	92
MUF150US48B			2.09		
MEF150US48B			2.71		
MDF150US48B			2.71		

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	AC input	85		264	VAC
	DC input	120		370	VDC
Input frequency	AC input	47		63	Hz
Input current	115VAC and Full Load			1.7	A
	230VAC and Full Load			0.8	
No load input power	230VAC		0.6		Watts
	230VAC			0.3	
	Others				
Leakage current	264VAC			100	μA
Power Factor		0.95			
Start up time				1000	ms
Rise time			20		ms
Hold up time	115VAC and Full Load	16			ms
Input inrush current	230VAC			60	A
Input protection	Internal fuse in line and neutral			T3.15A/250VAC	

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output power	Forced air cooling with 10CFM or Option -F Natural convection for 15Vout, 18Vout, 24Vout, 28Vout, 36Vout Natural convection for 12Vout, 48Vout			150 110 100	Watts
Initial set voltage accuracy	230VAC and Full Load	-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load 10% Load to 90% Load	-0.5 -0.4		+0.5 +0.4	%
Voltage adjustability		-10		+10	%
Minimum load			0		%
Ripple and noise	Measured by 20MHz bandwidth With a 1 μ F/25V 1206 X7R MLCC 12Vout 15Vout 18Vout With a 1 μ F/50V 1206 X7R MLCC 24Vout 28Vout 36Vout With a 0.1 μ F/100V 1206 X7R MLCC 48Vout		120 150 180 220 220 250 250		mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response	Load step from 50 ~ 75% change at 2.5A/ μ s Peak deviation Recovery time		500	3	% Vout μ s
Over voltage protection	% of Vout(nom); Latch mode	115		135	%
Over load protection	% of Iout rated; Hiccup mode	115		150	%
Short circuit protection					Continuous, automatic recovery
Fan power supply					12V at 500mA

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute (2MOPP insulation) Input to Output Input (Output) to F.G.	4000 2000			VAC
Isolation resistance	500VDC	0.1			G Ω
Switching frequency			60		kHz
Safety approvals	IEC/ EN/ ANSI/AAMI ES 60601-1 IEC/ EN/ UL 60950-1			UL:E360199 CB:UL(Demko)	
Weight	MAF MUF MEF MDF			187g (6.60oz) 235g (8.29oz) 256g (9.03oz) 278g (9.81oz)	
MTBF	MIL-HDBK-217F Ta=25°C, Full load			7.861 x 10 ⁵ hrs	

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating Option -F (With Fan) Others	-25 -25		+80 +85	°C
Storage temperature range	Option -F (With Fan) Others	-40 -40		+75 +85	°C
Operating altitude				5000	m
Thermal shock				MIL-STD-810F	
Shock				IEC60068-2-27	
Vibration				IEC60068-2-6	
Relative humidity	Non-condensing			5% to 95% RH	

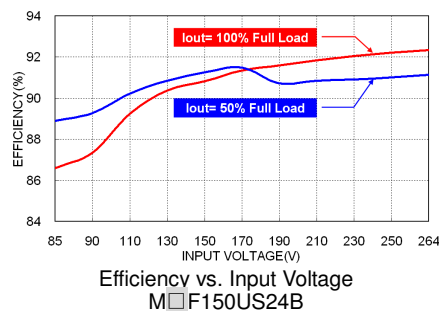
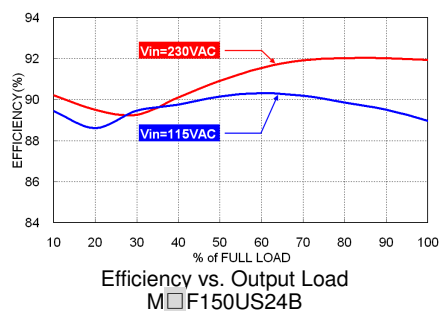
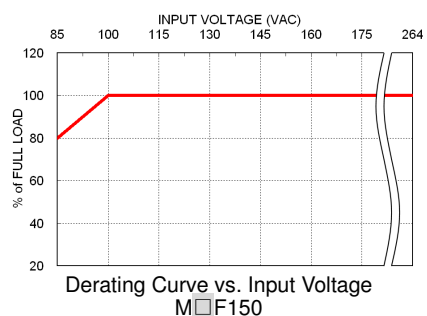
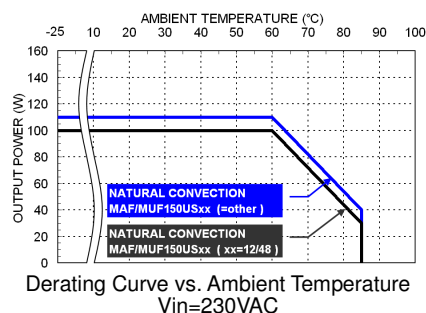
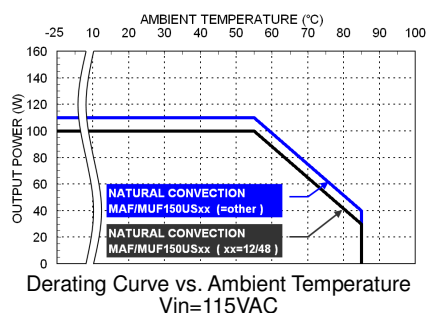
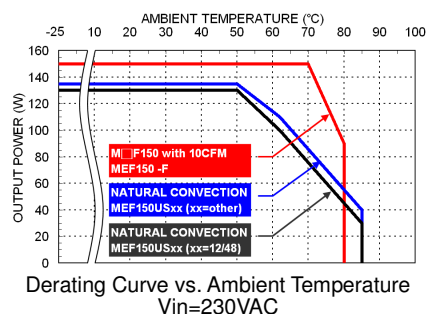
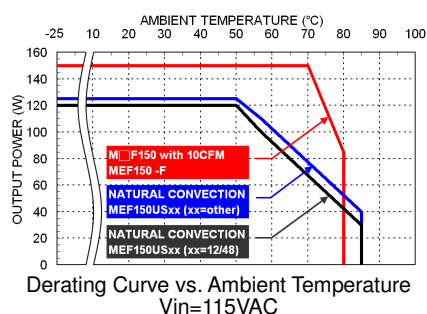
EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI	EN55011, EN55032, EN60601-1-2 and FCC Part 18 / 15 External components may be required for class I application.	Conducted Class B Radiated Class A
Harmonic currents	EN61000-3-2 Full Load	Class A and D
Voltage flicker	EN61000-3-3	

EMC SPECIFICATIONS (CONTINUED)

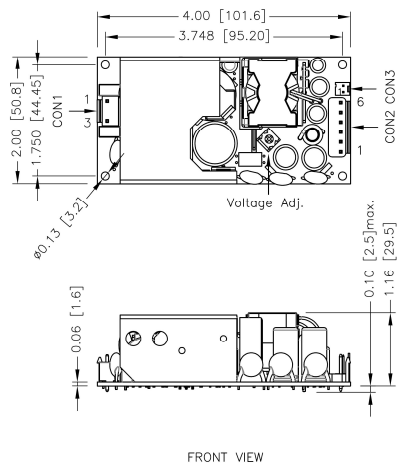
Parameter	Conditions		Level
EMS	EN55024 and EN60601-1-2		
ESD	EN61000-4-2	Air $\pm 15\text{kV}$ and Contact $\pm 8\text{kV}$	Perf. Criteria A
Radiated immunity	EN61000-4-3	20 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	$\pm 2\text{kV}$	Perf. Criteria A
Surge	EN61000-4-5	DM $\pm 1\text{kV}$ and CM $\pm 2\text{kV}$	Perf. Criteria A
Conducted immunity	EN61000-4-6	20 V _{r.m.s}	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	10 A/m	Perf. Criteria A
Dip and interruptions	EN61000-4-11		

CHARACTERISTIC CURVE

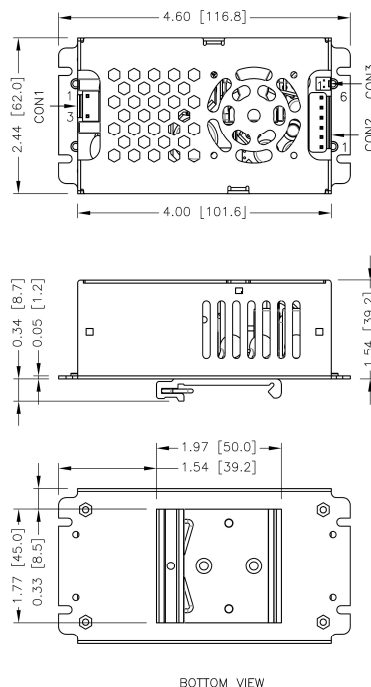


MECHANICAL DRAWING

MAF Open type



MDF Din rail type



CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

CON2 – Output Connector

Pin 1,2,3	-Vout
Pin 4,5,6	+Vout

CON3 – Fan Connector

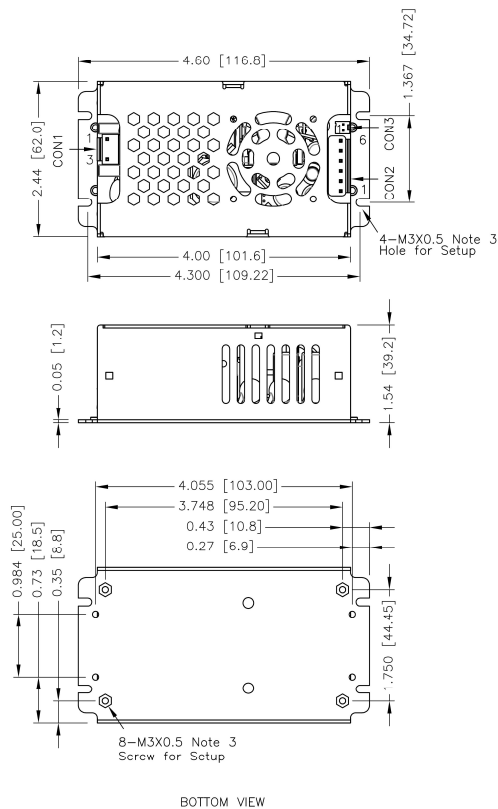
Pin 1	-Fan
Pin 2	+Fan

Mates with
Molex housing : **22-01-1022**
Molex crimp terminals : **2759**

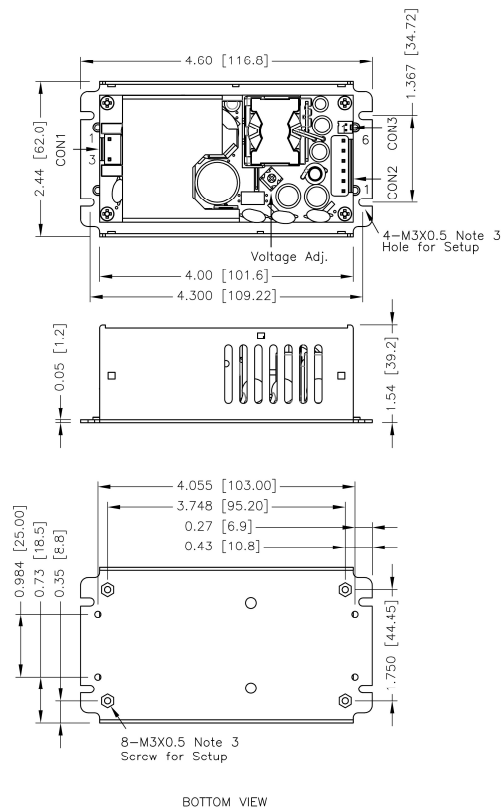
*Either one of four screws holes of Open / Chassis type can be considered as PE connection for CLASS I application.

MECHANICAL DRAWING(CONTINUED)

MEF Enclosed type



MUF U chassis type



1. All dimensions in inch [mm]
2. Tolerance : $x.xx \pm 0.02$ [$x.x \pm 0.5$] $x.xxx \pm 0.01$ [$x.xx \pm 0.25$]
3. M3x0.5 screw locked torque MAX 5Kgf.cm/0.49N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

CON2 – Output Connector

Pin 1,2,3	-Vout
Pin 4,5,6	+Vout

CON3 – Fan Connector

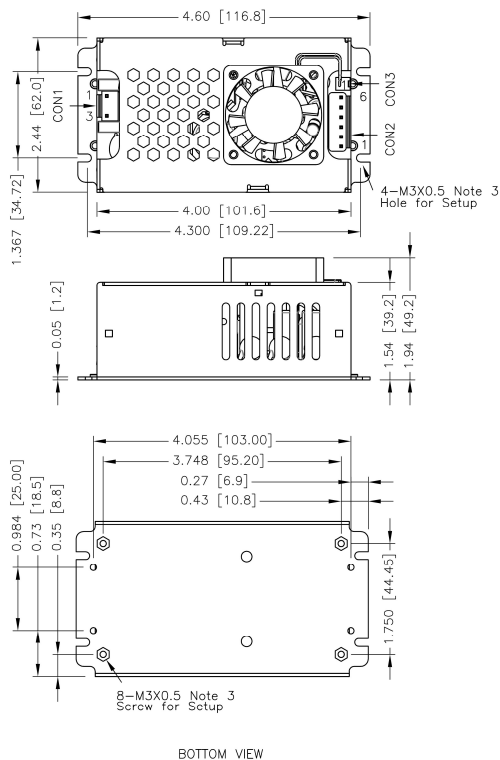
Pin 1	-Fan
Pin 2	+Fan

Mates with
Molex housing : 22-01-1022
Molex crimp terminals : 2759

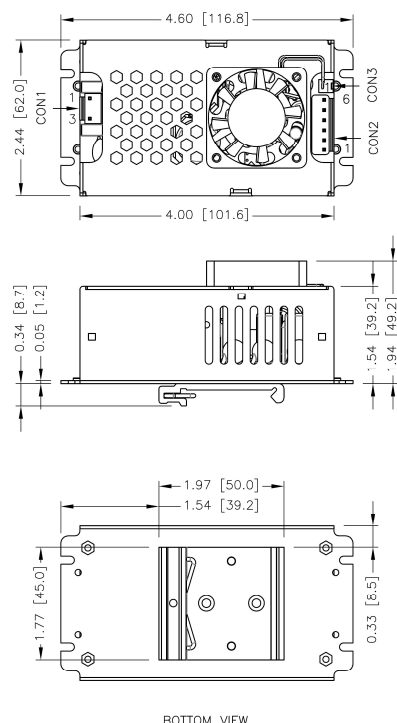
*Either one of four screws holes of Open / Chassis type can be considered as PE connection for CLASS I application.

MECHANICAL DRAWING (CONTINUED)

MEF -E Enclosed type with FAN



MDF -E Din rail type with FAN



1. All dimensions in inch [mm]
2. Tolerance : $x.xx \pm 0.02$ [$x.xx \pm 0.5$] $x.xxx \pm 0.01$ [$x.xx \pm 0.25$]
3. M3x0.5 screw locked torque MAX 5Kgf.cm/0.49N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

CON2 – Output Connector

Pin 1,2,3	-Vout
Pin 4,5,6	+Vout

CON3 – Fan Connector

Pin 1	-Fan
Pin 2	+Fan

Mates with
Molex housing : **22-01-1022**
Molex crimp terminals : **2759**

*Either one of four screws holes of Open / Chassis type can be considered as PE connection for CLASS I application.

CONNECTOR OPTIONS

Blank:

JST Type

Mates with housing
CON1: VHR-3N
CON2: VHR-6N

Crimp terminals
CON1: SVH-21T-P1.1
CON2: SVH-21T-P1.1



-M

Molex Type

Mates with housing
CON1: 09-50-8031
CON2: 09-50-8041

Crimp terminals
CON1: SD-2478
CON2: SD-2478



-T

Terminal Block

Screw locked torque
MAX 2Kgf.cm/0.2N.m

Wire dimension range
26 ~ 16AWG



EXTERNAL FAN OPTION

There is an external fan option for MEF and MDF. The fan's life is shorter than power supply and has only 2 years warranty. Here are specifications for replacement.

Fan dimensions	40 x 40 x 10 mm
Air flow	7 CFM

